

Summary of the Spatial and Temporal Distribution of Atlantic Coast Striped Bass

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SUMMARY

Anadromous populations of Atlantic coast striped bass, *Marone saxatilis*, range from the St. Lawrence River, Canada to the Roanoke River, North Carolina (ASMFC 1990). Anadromous striped bass spawn in discrete coastal rivers and estuaries in the spring and then either return to the ocean or remain in coastal estuaries. In USA waters, discrete and self-sustaining spawning stocks of striped bass have been documented in the Hudson River, Delaware River, Chesapeake Bay and Roanoke Rivers (Rago et al 1989) and an emerging stock is thought to exist in the Kennebec River estuary (Flagg and Squiers 1999).

The temporal and spatial extent of striped bass migration differs by age, sex and river of origin across a latitudinal gradient. The onset of spawning migration in the Hudson River usually begins during early April and extends through mid-June (Hoff et al 1988). Recent tagging of the Hudson River spawning stock (ASMFC 2004) shows that, after spawning, larger and older (ages 7+) female striped bass undergo extensive migration northward to coastal and offshore waters from New York to Maine from July through November. During this period, few tag recoveries of adult female stripers have been reported south of New Jersey. However, during winter months (December-February), larger female stripers apparently undergo extensive migration southward to coastal Virginia and North Carolina and apparently remain there until spawning season (March-April). Nearly all tag recoveries reported from mature female Hudson stripers have occurred during winter off of Virginia and North Carolina. Whether or not mature male striped bass (ages 3+) undergo extensive migration into New England waters is not nearly as clear as for mature female bass based on tag-recapture studies. Juvenile striped bass from the Hudson River stock tend to migrate by late August into Long Island Sound, along the south shore of Long Island and along the New Jersey coast (Boreman and Klauda 1988, Vecchio 1992). The temporal-spatial distribution of sub-adult (mostly ages

1-4) and male striped bass from the Hudson stock is somewhat unclear. Recent tagging studies in the Hudson River and off Long Island (ASMFC 2004) indicate that smaller and younger (ages 2-4) stripers remain mostly in estuaries adjoining the tri-state area (Connecticut, New York and New Jersey). Only about 1-3% of recaptures from sub-adult Hudson stripers has been taken south of New Jersey.

The Chesapeake Bay stock of striped bass is widely regarded as the largest of the four major spawning stocks (Goodyear et al 1985, Kohlenstein 1980, Fabrizio 1987). Spawning migration in the Chesapeake usually begins during early April and extends through mid-June (Kohlenstein 1980). Recent tag-recovery studies in the Rappahannock River and upper Chesapeake Bay (ASMFC 2004) show that, after spawning, larger and older (ages 7+) female striped bass move more extensively along the Atlantic coast than stripers from the Hudson River stock. Tag recoveries of Chesapeake stripers from July through November have occurred as far south as Virginia to as far north as Nova Scotia, Canada. As winter approaches, mature female stripers undergo an extensive southward migration. Like the Hudson River stock, nearly all tag recoveries from mature female stripers from the Bay stock have taken place during winter (December and February) off Virginia and North Carolina. Kohlenstein (1980) tagged mature (ages 3+) male stripers in the Choptank River, Maryland from 1977-1979, and noted that few mature male stripers were recovered outside of Chesapeake Bay. Based on these findings, Kohlenstein (1980) concluded that most mature male stripers from the Chesapeake stock are not migratory. Juvenile male and sub-adult (ages 1-4) female striped bass are known to remain within the Bay (Goodyear et al 1985) for several years. But as sexual maturity approaches, female striped bass gradually (ages 4-8) emigrate from the Bay and join the coastal migratory stock. These migratory female stripers return during April and May to spawn in the Chesapeake. Juvenile striped bass are known to remain in Chesapeake Bay and use it as a nursery area for several years.

The Delaware River stock of striped bass had been in recruitment failure until about 1990 primarily due to long-term and severe hypoxic conditions near the city of Philadelphia (ASMFC 1990). Following extensive pollution abatement during the mid-1980's, striped bass abundance in the Delaware, as measured by juvenile seine surveys, rose steadily thereafter to peak abundance in 2003 and 2004 (Tom Baum NJ BMF pers. comm.). Like the Chesapeake Bay and Hudson stocks, spawning migration in the Delaware River begins during early April and extends through mid-June (ASMFC 1990). Recent tagging studies in the Delaware River (ASMFC 2004) show that larger and older (ages 7+) female striped bass undergo extensive migration northward into New England from July to November that spatially overlap the migratory range of Chesapeake striped bass. Like the Hudson River and Chesapeake stocks, nearly all tag recoveries from mature female stripers from the Delaware River have taken place during winter (December and February) off Virginia and North Carolina. The spatial and temporal distribution of male and sub-adult female (ages 1-6) stripers from the Delaware River to the coast is not well understood.

The overall abundance of the Roanoke River stock of striped bass is believed to be the smallest of the four anadromous stocks. Early tagging studies of spawning stripers in the Roanoke River (Merriman 1941) revealed very limited mixing with the coastal migratory

stock. However, the extent of coastal migration of Roanoke River stripers is apparently greater than previously thought. Recent tagging studies in the Roanoke River from 1990 to 2003 have indicated that several larger and older (ages 7+) female stripers have been recovered within estuaries from Delaware through New England 1994 (Wilson Laney US F&WS pers. comm.). Sub-adult (ages 1 to 5) and juvenile striped bass from the Roanoke are known to use Albemarle Sound as a nursery area (Olsen and Rulifson 1992).

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